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ORIGINAL ARTICLES.

FOREIGN BODIES IN THE ORBITAL CAVITY.[1]

BY WALTER B. JOHNSON, M.D., PATERSON, N. J.

The cases of foreign bodies in the orbital cavity herewith reported, are of interest because of the very considerable size of the bodies themselves, the demonstrated ability of the orbital contents to withstand the ravages of the inflammatory processes induced by their continued presence, and the comparatively satisfactory results attained, except in case No. 2 which terminated in death as a result of suppurative meningitis induced by perforation of the right anterior lobe of the cerebrum.

The size of at least one of the other foreign bodies, *i. e.*, case No. 1, would seem to indicate the certainty of its having penetrated the cerebral cavity although there was no evidence of any inflammatory process having occurred as a result, and no method of determining its exact course.

CASE No. 1.—C. B., age 14, 1886. The patient applied for treatment at the Paterson Eye and Ear Infirmary stating that

[1]Read at the Congress of American Physicians and Surgeons, Washington, 1894.

one week previous to his present visit he fell from a cherry three while picking cherries, striking the left side of his face upon a number of dead cherry branches receiving several lacerated wounds about the forehead and nose and a punctured wound of the left upper eye lid. A physician of the City of Passaic, at which place the accident occurred, was called and sutured the wound in the lid. He suffered great pain during the night and the eye, which commenced to swell immediately after the injury, became still more prominent. The day following the injury he called upon Dr. H. D. Withers, of Paterson, N. J., who resorted to antiphlogistic treatment which had no beneficial effect, the exophthalmos continuing to increase and the œdema of the lids continually progressing.

July 16. The patient was referred to the Paterson Eye and Ear Infirmary for treatment. Ether was administered, an examination disclosed a complete ptosis of the lid which was reddened and distended, considerable exophthalmos and some conjunctival chemosis, the swelling of both eyes and lids was so extensive that sufficient separation could not be made to permit satisfactory examination of the eye ball, the wound in the upper lid which was situated in the median line about midway between the margin of the lid and the eye-brow, had undergone almost perfect union, one small point only remaining open. There was no perception of light; on palpation a hard substance was discovered under the upper eye lid immediately behind the punctured wound.

The edges of the wound were freely separated with the scissors and a foreign body located at a point fully one-quarter of an inch behind the outer edge of the wound. It was seized with a pair of strong forceps and removed, considerable force being necessary to dislodge it; its course seemed to be backward and somewhat downward towards the apex of the orbital

cavity. Its removal was not followed by the discharge of pus.

The foreign body was a piece of dead cherry branch and was two and three quarters inches in length and one-quarter of an inch in thickness; the bark was intact, the end which penetrated the orbital cavity was broken in a sharp jagged point, the other end being almost flat.

The wound was left open and the eye dressed with cooling lotions. During the following day the pain which had been very severe subsided. The wound healed kindly and without any material suppuration; the exophthalmos, œdema and inflammation gradually diminished. There were no symptoms of cerebral affection either during the week that he carried the foreign body in his orbit or the ten days subsequent to its removal although it seemed that the foreign body must have passed backward into the orbit and probably through the sphenoidal fissure into the cerebral cavity.

July 26. Ten days after the removal of the foreign body the boy left for his home in Brooklyn and subsequently consulted Frank W. Ring, M.D., of New York, who treated him and reported his case in the New York *Medical Record* of August 13, 1887, in part as follows:

July 28. "There is complete ptosis of the lid, it is swollen, red and œdematous capable of no movement whatever. The eyeball is natural in appearance; complete paralysis of all the muscles, absolute loss of movement of the eye. Pupil slightly dilated, not susceptible to light. Vision limited to slight perception of shadows. Ophthalmoscopically there are no marked changes, blood vessels of good size, no tortuosity, slight œdema of the disc with some grayish haziness, complains of the unpleasant sensation caused by the drooping lid, no pain."

February 22, 1887. "The vision has not improved to any marked degree during the last three months. From figures at two feet he now sees $^{6}/_{cc}$. There is slight ptosis. A divergence from insufficiency of the internus not disagreeably marked. The nerve is bluish white, blood vessels of retina decreased in size. Has no pain and little discomfort from loss of vision.

The right eye has $^{20}/_{XV}$ with H .75 D. General condition excellent."

"Several instances have occurred where larger foreign bodies than this have remained undiscovered back of the eye in the cellular tissue, and even penetrating into the brain; but I can find record of none occurring where the ultimate result of such an injury was attended with so little calamity."

CASE NO. 2.—J. P., age 49. Holland. On April 26, 1894, was brought to St. Joseph's Hospital, Paterson, N. J., from Boonton with the following history:

On the morning of this same day, he was running a circular saw when the power was suddenly increased causing a pine plank he was sawing to be shivered, sending small splinters in all directions. A piece of the plank struck him in the right eye causing several wounds of the eyelids and the conjunctiva.

April 27. On examination the upper eyelid was found to be entirely cut through about in the median line; the cut extending from the margin of the lid towards the temporal side of the eyebrow upwards and outwards one inch and a quarter; there was a vertical incision three-quarters of an inch in length across the inner canthus through the upper eyelid and entirely detaching the lower eyelid which was torn off for a distance of one inch through conjunctiva and skin, a portion of skin was also torn from the cheek below this point up to the cut over the inner canthus; the lids were œdematous although the ocular conjunctiva was not materially involved; there was a small cut in the eyeball on the nasal side about at the limbus, the pupil was widely dilated, the globe was tense, the impact of the blow having caused an extensive intraocular hæmorrhage. At a point fully half an inch behind the plane of the eyeball there was lodged a foreign body. There was no perception of light. The patient was etherized and the foreign body seized with a pair of thumb forceps and easily removed; it was a splinter of pine wood two and one-eighth inches in length and about one-quarter of an inch square. The direction was backward and upward. The eyelids were care-

fully sutured. Hot applications were ordered and an occasional drop of a solution of sulphate of atropia, four grains to the ounce, and an hypodermic of morphine if pain was severe. On the evening of the operation the temperature was 101°; it fell to 100° next morning and remained within one or two-fifths of this temperature for the next five days.

April 30. Three days after the operation a purulent discharge appeared at the conjunctival wound, the œdema had diminished, the pain disappeared and the patient was quite comfortable; the sutures were removed and considerable union had taken place, the lower lid, however, had separated at the inner canthus.

May 3. On the afternoon of the sixth day he was allowed to sit up, but had not been out of bed fifteen minutes before he had a severe chill followed by an elevation of temperature of $104^{1}/_{5}°$.

May 4 and 5. The following two days were very restless. He was delirious and when he could talk intelligently he complained of severe headache especially in the back of his head.

May 6, 7, 8 and 9. For the following six days after the chill his temperature ranged from 101° to 102°, during this time the œdema constantly decreased, but the headaches continued and the purulent discharge increased; the eyeball became progressively worse, suppurative choroiditis developed.

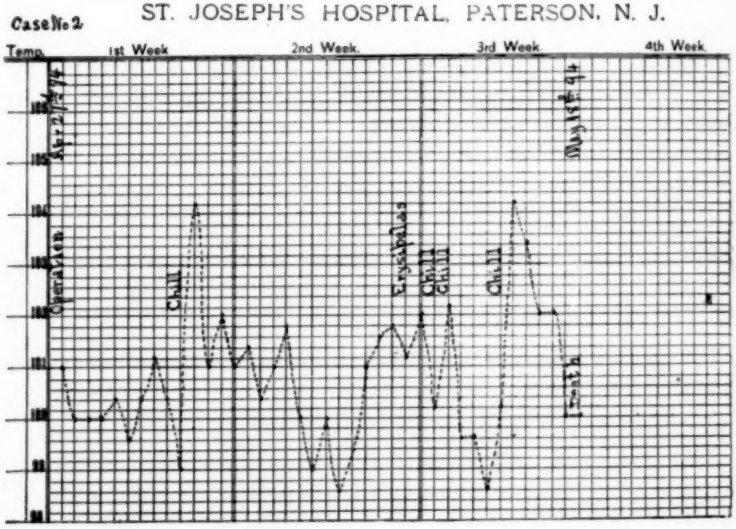
May 10 to 15. At the end of the second week erysipelas of the face extending to the head, and involving both ears, appeared. He again became delirious and remained so for the greater part of the time that the erysipelas lasted. Lead and opium wash was applied constantly. Iron and quinine was administered; he drank large quantities of milk. During the erysipelatous attack the panophthalmitis progressed very rapidly and the cornea sloughed. He had several chills during

this stage; his temperature ranging around 102°; in his lucid moments he complained of excruciating pain in his head.

May 15. His temperature fell to normal, the erysipelas entirely disappeared, the delirium subsided and he became rational for twenty-four hours. The following day another chill and temperature of $104^{2}/_{5}°$ induced delirium and restlessness so that he could, with difficulty, be kept in bed.

May 17. His condition was fair and the indications were favorable, but at night his restlessness returned; the cornea suppurated and the contents of the eyeball escaped. He was mildly delirious and had a constant diarrhœa.

May 18. He grew steadily worse and in the morning at 8 o'clock died, just three weeks after the foreign body was removed from the orbital cavity.



These data for the history of the case were kindly furnished by J. D. Gressim, M.D., house surgeon at the Hospital.

Autopsy eight hours after death. Rigor mortis present, the eyeball which was moderately full yesterday is flat, the con-

tents of the globe having been discharged during the night, the œdema of the eyelids which was very well marked yesterday has entirely disappeared. The calvarium was removed, over the cerebrnm under the dura mater there were extensive deposits of pus and lymph, both hemispheres being involved. The left side although opposite the injury had been the more seriously infected and contained the greater quantity of the new deposit. The vessels of the membranes were engorged especially over the occipital lobes and there were several deposits of lymph on the under surface of the dura mater, involving the dura mater, the pus deposits were upon the arachnoid, and there was some serum under the archnoid, but no purulent or lymphoid deposit had occurred there. There was no deposit of lymph or pus at the base of the brain except at the point of perforation. The right frontal lobe on its orbital surface had been perforated by the foreign body and had undergone inflammation, softening and disintegration.

The orbital plate of the frontal bone was fractured and was displaced, the fracture which was very extensive extended from a point on a line with and one-half inch to the right of the crista galli outward three-eighths of an inch and backward

to one and one-half inches to and involving the sphenoidal fissure and the optic foramen extending through the lesser wing of the sphenoid bone and along the articulation of the orbital plate of the frontal bone with the cribriform plate of the ethmoid. The edges of the fracture were separated about one-quarter of an inch at the point at which the foreign body penetrated the cerebral cavity which was about midway between the point at which the line of fracture began and the sphenoidal fissure.

The brain substance was normal and had apparently undergone no inflammatory action except at the point of injury where the softening and disintegration had occurred; this softening involved the brain substance for a space equal to the size of a silver dollar and extended into it for about one-half inch, beyond which point the brain tissue seemed perfectly healthy. The fluid in the ventricular cavities was slightly turbid but there was no apparent distention or congestion.

CASE NO. 3.—O. L., age 7; German, December 26, 1886. The patient, a strong well nourished boy, applied at the Paterson Eye and Ear Infirmimary for treatment, and stated that two days previous to his present visit while running he fell upon a piece of stick which he was carrying in his hand, and that a large splinter had penetrated the eye lid. A neighboring woman removed the splinter and in pulling it out was obliged to use great force.

When his mother, who was out at work, reached home she found him suffering great pain and there was excessive tumefaction of the eyelid which progressed continuously and was accompanied by increased pain which was so severe that he was unable to sleep. The patient was very weak and dizzy and vomited several times during the afternoon and evening. The day after the injury the pain and swelling had increased, the vomiting and dizziness had subsided. He was then brought to the Infirmary.

December 26. On examination of the right eye a small scab about one-eighth of an inch in diameter indicated the point at which the punctured wound was located, which was in the up-

per eyelid about one-quarter of an inch from the median line and nearer the eye brow than the margin of the lid. There was some exophthalmos, sub-conjunctival ecchymosis and chemosis of the ocular conjunctiva especially at the upper and outer side in the vicinity of the wound. The eyelids were swollen and œdematous, the upper lid being inflamed, reddened and very tense. On forcible palpation a foreign body was located deep in behind the point of the puncture. There was slight perception of light. The pupil was dilated and fixed. The pain was so severe and the lids so difficult to separate that a satisfactory ophthalmoscopic examination could not be made. There was complete ptosis and the movements of the eyeball were very limited, especially outward and upward. Ether was administered, the small scab was removed and a slight purulent discharge oozed from the wound. The foreign body was located, it was situated fully one-half inch behind the edge of the wound. The eye lid was incised from the wound outward and inward and the foreign body seized by a pair of strong thumb forceps. It was easily removed. There was no discharge of pus from the deeper part of the wound. The course of the foreign body was almost directly backward. It was a piece of pine wood one and one-quarter inches in length and about one-eighth inch in thickness; it was about square.

Case N°3

There was no subsequent discharge from the wound which healed kindly. The pain rapidly subsided. All of the inflammatory symptoms continuously improved. At the end of three weeks the eye had entirely resumed its normal appearance and the muscles regained their full strength. The vision had steadily improved and was $^{20}/_{XXX}$ in the affected eye.

July 21, 1891. Nearly two years after the injury he was again examined; there was no difference in the appearance of the eyes except a slight scar on the right upper lid and the vision was $^{20}/_{XV}$ each.

CASE NO. 4.—W. M., age 36, U.S., 1888. Applied for treatment at the Paterson General Hospital stating that while engaged in firing salutes for a political procession the cannon was prematurely discharge by the concussion of the ramrod and he received an injury.

On examination thirteen hours after the accident the face was found to be literally filled with cannon powder, dry grass and stubble, with which the cannon had been wadded. He had an extensive scalp wound and a lacerated wound of the hand, the little finger was torn away. The eyelids were swollen and perforated by bits of the stems of weeds and grass; in the right eye some of the foreign bodies had penetrated the eye ball; in the left eye a number of large pieces of the stems of weeds had passed into the orbital cavity on the nasal and temporal side of the globe, the eyeball itself having escaped serious external injury although there were many more pieces of grass and weeds than in the right side, three or four grains of powder were impacted in the cornea and two grains passed entirely through it and were lodged in the iris. The pupil was dilated widely and not responsive to light; he had no perception of light in either eye.

September 5. The patient was ætherized and dozens of pieces of dried weeds, powder, grass, and stubble were removed varying in size from the thinnest blade of grass to the stems of of weeds and stubble nearly one-eighth of an inch thick and in some cases fully one inch in length.

The right eyeball collapsed upon the removal of the penetrating foreign body, which had torn a ragged wound through the cornea, destroyed the lens, and entered the cavity of the vitreous. The efforts at the removal of the foreign bodies were continued until every thing except some of the powder grains were removed. Active antiphlogistic treatment was ordered.

September 6. Following the operation which was very tedious there was a decided increase in the œdema of the lids, and in the conjunctival chemosis which increased until the fourth day, when the inflammation which was especially marked

in the right eye became more severe. Panophtha'mitis developed, enucleation seemed absolutely necessary.

September 11. The inflammatory symptoms have somewhat abated, an enucleation was postponed, the pain and œdema commences to diminish.

September 15. The patient has steadily improved; he is now able to see shadows with his left eye, the pupil is still dilated, the vision in the right eye is entirely destroyed, the tension is greatly diminished, and there is commencing phthisis bulbi.

Ophthalmoscopic examination was not satisfactory in consequence of the cloudiness of the vitreous; and extensive subretinal hæmorrhage seemed to have occurred. The subsequent course of the disease was uneventful, the symptoms gradually dissappeared.

September 29. He was allowed to return home, his vision being about $^{6}/_{cc}$. From this time his improvement has been very slow, but positive until the present time.

Present condition, May, 1894. The right eye has developed phthisis bulbi, the cornea is partially destroyed and the eyeball sunken and irregular; there are several cicatricial contractions, he has never had any pain since the subsidence of the original inflammation. The left eye has a large symblepharon on the temporal side of the globe resulting from conjunctival contraction. The eye ball is discolored by powder stains, the pupil reacts promptly to light.

Ophthalmoscopic examination reveals an extensive rupture of the choroid which is situated on the temporal side of the optic nerve entrance and extends to the extreme limit of the field as depicted in the accompanying cut.

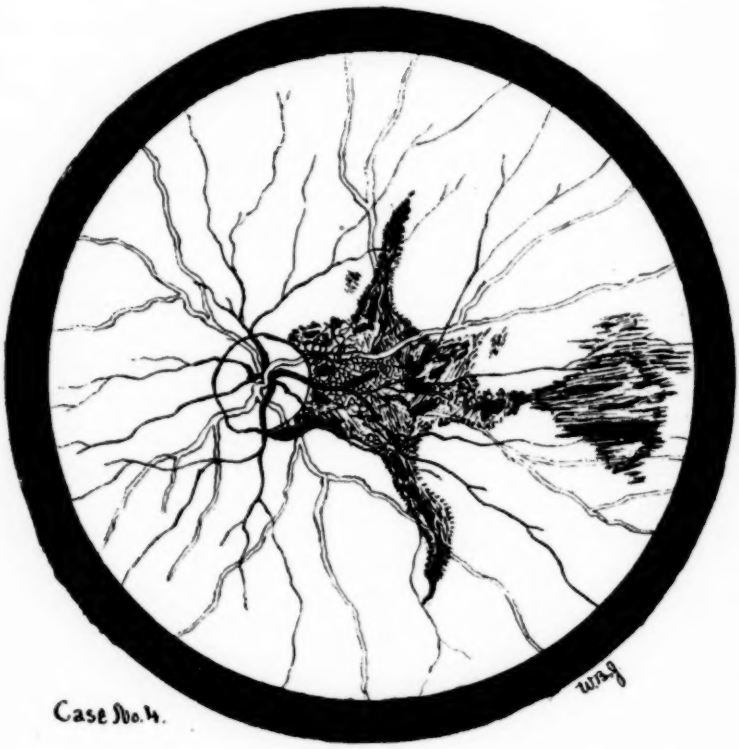
The character of the rupture would seem to indicate that it was partially the result of direct violence upon the peripheral portion of the injured choroid, and partly the result of contrecoup on the part of the choroid near the nerve entrance, at these points there seem to exist two separate and almost distinct ruptures; the concussion from the cannon added to the

force of the foreign bodies striking the eyeball must have been very great.

R. V.=0.

L. V.=$^{10}/_{cc}$.

He has a sensation of light in the left eye which constantly flitters before the eye night and day and can be seen even when the eye is closed. He describes this light as a black center



surrounded by moving light, which is no doubt due to the blind spot in the field of vision caused by the choroidal rupture. He was for some time after the injury troubled with rainbow light flashes, which would circle around and then burst, as time passes he sees less of these and he thinks his vision has steadily but very slowly improved. He has at pre-

sent no discomfort except the inability too see. He used to suffer from photophobia, but it has now entirely subsided. He is and has been constantly employed as night watchman. There has been no change in the objective or subjective symptoms observed at any examination which has been made during the past two years.

DISCUSSION ON FOREIGN BODIES IN THE ORBITAL CAVITY.

DR. H. KNAPP of New York.—Mr. President: Foreign bodies in the orbit are sometimes very difficult to deal with both as to the diagnosis and treatment. A few months ago I was called by a surgeon to see in consultation a boy who had been wounded by a No. 22 birdshot, which had entered the upper inner corner of the orbit. The eye did not move upwards and the upper part of the orbit was hard, evidently filled with blood. As we could not locate the body we agreed that the most advisable course to pursue was to wait. This course was followed and the boy who had had complete ptosis recovered the mobility of his eye to a certain degree. When I first saw the patient, immediately after the injury, there was a good deal of blood in the interior of the eye, in the inner upper part, the retina was raised, apparently detached; lower down I could not see the fundus clearly. I thought that this was simply owing to the foreign body having struck the eye on the posterior part outside and having produced hæmorrhage inside. Now the interior of the eye has cleared up. In the inner upper part there is a long scar about five or six diameters of the optic disk and around it a good deal of black pigment. Below the optic disk there is a hemispherical elevation of two disk diameters in breadth and three in length. Its crest is seen sharply with strong convex lenses. The retina covers this foreign body without any movement and the surface of the elevation is slightly striated and grayish white. From all this I could only conclude that the bullet had not merely struck the sclerotic but had pierced it, entered the eye and is now fastened at the background in the lower part causing no irritation.

The fourth case mentioned by Dr. Johnson reminded me of this case.

DR. W. B. JOHNSON of Paterson, N. J.—Mr. President: I remember a case somewhat similar to the case mentioned by Dr. Knapp in which a shot from a shotgun—birdshot—passed entirely through the eyeball. I think I reported that case with some thirteen or fourteen other cases in Milwaukee last year, under the title of "Quiescent Foreign Bodies." That birdshot, however differed from his case in that it passed entirely through the eyeball and there was a subsequent return of normal vision in that eye, although the shot passed just without the limbus in the ciliary region and the point of location at which the shot passed out of the eye could also be demonstrated in the fundus by ophthalmoscopic examination, it became a foreign body in the orbit and became encysted there I suppose. There was no further trouble and the vision became normal. I think these cases of foreign bodies in the orbital cavity are very interesting, fortunately we do not see very many of them and I think it is a very good thing that we do not, although the orbital contents certainly in a great many instances are able to withstand a great deal of injury and come out of it in very good condition.

Case No. 2, however, in which the foreign body penetrated the cerebral cavity, was very serious. In the reported cases of foreign body in the orbit which came to autopsy, the cerebral cavity had generally been penetrated and cerebral disease had resulted. Whether many of the other cases which recovered, although the foreign bodies were so large as to have almost certainly penetrated the cerebral cavity, really did recover after such penetration, can only be conjectured, although the indications all seem to point to the possibility of such injury occurring without fatal termination.

HEADACHES.[1]

BY O. LANDMAN, M.D., TOLEDO, OHIO.

I was led to write upon this subject to see whether there were any correspondence between the location of an headache and its cause. Again, because I felt that the nerve cells might possibly be the seat of pain, notwithstanding the evidence to the contrary.

The brain tissue may be lacerated and torn without producing any response, hence it is considered insensible. Yet, electrical stimulation of the gray matter will evoke muscular evidences of an impression having been made.

Now then, does it follow because, in the brain, any mechanical mutilation, an unnatural process, does not seem to produce pain that this would be the case if a group of nerve-cells were overworked by sensations flowing to it along a set of nerves. May they not be wearied even after the cessation of inflowing stimuli? The nature and character of the stimulus determines whether the nerve cell will respond and an electrical current may closely resemble the natural phenomenon of excitation.

The afferent nerves are the natural highways and means of transmission of energy. All of us have experienced a feeling of dull pain after excessive mental strain and we refer it deeply within and not superficially.

There is the quality of irritability possessed by simple protoplasm which makes it respond to an external stimulus, but this irritability is presumably independent of any special nervous elements. The property is an inherent quality.

We must endeavor to adduce evidence to prove that a nerve cell feels and hence possesses sensation. Although we can

[1]Read before the Toledo Medical Association.

not believe that irritability is a sign of pure sensation yet there are some peculiar evidences that would point to this. Thus in the plant called Mimosa Pudica during the day the leaflets fall into a horizontal position with their surfaces flat, and toward night two opposite leaves lie with their upper surfaces in coaptation and vertical. Stroking the under surfaces of the leaves produces the same movements but this does not follow upon irritation of the upper surfaces.

Again, in the Venus fly-trap the two parts of the leaf are at right angles to each other and adorned with bristles; the slightest touch to these induces a closure of the leaf. These phenomena are due to cell imbibition of fluids. There must be, however, some initiative force and a responsive substance.

Mills, in "An American Text-Book of the Diseases of Children," in an article entitled, "Headaches," says: "Nerve end-organs, which are an *essential* portion of the apparatus of sensibility are wanting in the brain itself."

I think that this is negatived by the fact that when a nerve be laid bare and the central end be stimulated, if it be affected by a current, the result is pain.

(Martin). "Perfectly characteristic sensations can be felt in the absence of the sense-organs through which they are normally excited. We believe that it is a center in the brain which is the most important element in determining a sensation rather than the end-organ." A very recent idea is that there are pain centers in the brain.

The general opinion is that every headache if it be within the cranium is in the dura or pia mater and in the former due to an irritation of the trigeminus and in the latter an irritation of the ganglionic sensory nerves produced by hyperæmia or anæmia. This does not explain to me how either by pressure or irritation of the sensory nerves of the membranes, headaches due to use of the brain tissue are caused. For here the hyperæmia is most probably in the vessels of the brain substance. The only way I could otherwise account for it, by the common theory, is that the fibrous tissue separating the convolutions, etc., is supplied by sensory nerves and the sensa-

tion deep within and not in the convexity. A muscle cell grows weary and exhausted by overwork then why can a nerve cell not grow tired and become conscious of its own weariness.

Even if we feel a pain in a certain part or spot is it there or only in the brain? If we believe that headaches may be in the nerve-cells or in some other structures supplied by sentient nerves then we can conveniently divide headaches into two broad classes, one central and cellular and the other non-cellular. This division is not based upon the cause.

I have not infrequently heard it stated and seen it written that headaches on the vertex in women were due to a uterine or ovarian reflex. This is not so true as I used to believe, for about twenty per cent. of the cases which I have tabulated show that the eyes were the cause, since attention directed to these organs corrected and cured the headaches on the vertex.

In over two-thirds of these vertex cases the patients complained of tenderness of the scalp which always *followed* the headaches. In these kind of headaches there is not infrequently great confusion of the mind. The headaches and tenderness disappear upon correction of the refractive errors.

When the headaches are general then you must look for some other cause than the eyes.

There is a necessity for examining and closely questioning a patient who may complain of *constant* headaches. In general headaches you muct exclude hyperæmia, anæmia and blood dyscrasia; for a uric acid diathesis might induce a neuritis in the branches of the trigeminus which supply the membranes of the brain. In general headaches where the cause is obscure potass. iodide or the red iodide of mercury is the most useful therapeutic agent.

In syphilis the headaches have a general character and possess a quality which is quite a constant attendant namely, a nocturnal exacerbation, nothing but mercury with iodide relieves them permanently but chloralamid relieves them temporarily. In anæmic headaches a recumbent posture and darkness, or massage are helpful in alleviating pain.

Sick headaches are almost generally preceded by some

nausea and are hemicranic in character. They can be brought to a speedy termination by administering a mild emetic and repose. Some times you will find a sick headache and ocular headaches associated when correction of any ocular defect excludes these from the case. One case under my care was cured of these sick headaches and vomiting by a correction of the refractive error. There are some headaches brought on by nervous excitement and worry, many persons work themselves into such a condition and many of these are due to an irritated state of the nerve protoplasm. In tumors of the brain as a rule the pain is indefinite as to its location but at times is in the region of direct pressure, and in fact external pressure, over the point of its location will cause more pain. In nasal reflexes the pains are more at the bridge of the nose and inner, upper and parts of the orbits.

From our experience we believe that most constant headaches arise from some ocular defects and hence we feel justified in dwelling at greater length upon the symptoms and characters of such cases.

In albuminuria you very often have a brow-ache. The observations were made upon some two hundred cases which the final histories have been obtained as nearly as possible.

There were more females than males. They were usually persons who used their eyes a great deal and had sedentary habits. They were generally cases who had had their general bad states corrected before I examined them. When a person comes to a physician complaining of constant headache, the first thing to determine is whether it can be localized. If not then as a rule there is some general cause. If they say that they have a headache in their eyes, or if they describe a sensation as if a pain ran directly backward in a horizontal line to the occiput, again if the patient complains of pain around the eyes after use, or back of eye, or a throbbing or pain that is worse evenings, or if rest relieves this pain then probably the eyes are the cause. I grant you that in such cases the pain is in the sensory nerves. We must admit authority and acknowledge that such has said that a deficient muscular

balance induces headache. Yet, in my opinion it is far more frequently an error of refraction and consequent strain thrown upon the ciliary muscle. The ocular nerves have their deep origin in the medulla and very frequently we have occipital headaches which I believe are central and in the nerve cells. In optic neuritis there is pain in the top of the head.

The regions in which headaches, due to eye strain, are found in the order of their frequency are as follows:

	PER CENT.
Supraciliary,	41.
Vertex,	20.
Occipito-frontal,	8.
Occipital,	12.
Temporal,	8.

Once out of 200 cases a general headache. Frontal-vertex, vertex and occiput, thirteen times. Five fronto-occipito-vertex. The clavus hystericus may often be cured by properly adjusted glasses. When there was severe occipital headache the patients complained often of a stiffness and soreness of the muscles at the neck. The cases that had occipito-vertex headaches were the ones that most often complained of tenderness of the scalp. Any thing that tends to improve the general muscular tone adds so much to the cure of the case. In some of my cases after the patients physical condition improved much, the glasses were laid aside and the headaches disappeared. In such cases the glasses were useful in bridging over a period of muscular weakness.

The discussion of headaches of infective fevers, etc., has been been purposely omitted in this paper.

OCULAR GYMNASTICS.

BY C. M. HOBBY, M.D., IOWA CITY, IOWA.

In these days of equilibrating muscles, anything that looks towards developing the strength of weak muscles, rather than diminishing that of strong ones, appeals to our judgment as likely to be more satisfactory in the end. Amongst these expedients the "rhythmic exercise," of Dr. Savage rightly meets with favor although it seems to be unnecessarily complicated with prisms, to suit theories rather than conditions. It is evident that it is impossible to make a prism take the place of the dumb-bell in muscular exercise, for the resistance of the prism is to *co-ordination* not to contraction.

The writer has for many years used muscular exercise and training in the treatment of strabismus, and has lately applied the same methods to the treatment of heterophoria with satisfactory results. The system employed, if anything so simple can be called a system, is to produce successive contractions of the muscle to be exercised, for a time short of extreme fatigue, from 30 to 100 contractions at first, increasing the number in accordance with the ability of the patient to bear the work.

Taking the right external rectus for example, with the left eye covered, the patient is directed to look at an object at a moderate distance (from 15 to 25 feet), 2. then without moving the head, to look at an object 20° to the right, then back at the first object and repeat, increasing the angle as it may be borne; the same method can be applied to any muscle selected, or to group effects.

Exercise of the ciliary muscle can be secured in a similar

way, by requiring the patient to look at a distant object then at one close by, using small objects and being careful to secure accommodation each time before changing. Exercise in co-ordination can be obtained by using both eyes first on a distant object then on a near one, using the same care to secure perfect accommodation before change, and repeating the changes as frequently as perfect accommodation will allow. Co-ordination can be practiced at differ distances and angles, and it is well for the patient to wear full correction of any refractive error while practicing accommodation or co-ordination, for it is better that he accustom himself to movements that are of use to him, rather than to train his muscles for work that they will not be required to perform.

This method of muscle training is very simple, requires no apparatus, and will accomplish all that is claimed in behalf of the so-called "rhythmic exercise," with prisms; and the writer believes that it will overcome any heterophoria that is not of degenerative origin.

CORRESPONDENCE.

Editor AMERICAN JOURNAL OF OPHTHALMOLOGY.—I notice an error in my article on "Albuminuric Retinitis in Pregnancy," in the May, 1894, number of your journal. It occurs in the fifth line on page 134. The words "albuminuric retinis" should read "*uræmic chemosis.*" The ocular conjunctivæ in this case were chemotic but the right worse than the left. The right conjunctiva showed a spot about the size of a gold dollar where the vessels were greatly injected and over which there was an intense itching. A slight amount of mucous was thrown off at this spot. Cocaine was used and the redness disappeared in a few days.

I have carefully examined ophthalmic literature on this subject and find only two cases that are in any way similar to this. One is reported by Swan M. Burnett, M.D., in the *Archives of Ophthalmology and Otology*, Vol. IX. This case occurred in pneumonia and he attributes it to vaso-motor disturbance, and adds that disturbances of the fifth nerve may cause it.

S. Pollack, M.D., in the AMERICAN JOURNAL OF OPHTHALMOLOGY, for May, 1893, reports a case of "Albuminuric Ophthalmia." In this case the entire eye suffered, the conjunctivæ being very chemotic; also iritis and neuro-retinitis. In my case there was no iritis, the pupils dilating perfectly throughout. The chemosis disappeared after labor.

L. R. CULBERTSON, M.D.

NEWS.

At the meeting of the California State Medical Society held in San José, April 17, 18 and 19, 1894, Dr. Barkan on behalf of the Society of Eye, Ear, Nose and Throat specialists, presented the following proposed law and the desirability of having it passed, saying that the document had been signed by nearly all the oculists. "The law which we should like to have endorsed by the State Medical Society and recommended to the proper committee on legislation for enactment at the next session of the Legislature is an exact copy of the law which has passed several State Legislatures in the East:

"The people of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1.—When one or both eyes of an infant become inflamed or swollen, or reddened, at any time within two weeks after its birth it shall be the duty of the midwife or nurse having charge of such infant, to report in writing within six hours to the Health Officer, or to some local official of the city, town or district in which the parents of the infant reside the fact of of such inflammation, swelling or redness of the eyes of the child.

"SECTION 2.—Any failure to comply with the provisions of this act shall be punished by a fine not to exceed two hundred dollars, or imprisonment not to exceed six months, or both."

The matter was referred to the Executive Committee.—*Pacific Medical Journal.*

SELECTIONS.

THE CAUSATION OF TRANSIENT INCREASE IN THE REFRACTION OF THE EYE DURING IRITIS; WITH REPORT OF A CASE.

BY JOHN T. CARPENTER, JR., M.D.

Adjunct Professor of Diseases of the Eye in the Philadelphia Polyclinic; Assistant Surgeon to Wills Eye Hospital.

Only a few years since, in a paper read before the American Ophthalmological Society, Dr. John Green called attention to the fact that in iritis there is often a "Transient Myopia" developed. He studied the symptom first in his own case, and afterward noted it in many of his patients suffering from iritic inflammation.

In 1888, Dr. Mittendorf brought before the same society, some observations upon what he termed "Symptomatic Myopia." He claimed as the cause of this condition "an advancement of the lenticular system toward the cornea, either by an increase of the contents of the vitreous chamber, or by a swelling of the lens itself" (cataract). He stated, furthermore, "that the infiltration into the vitreous must be in the shape of clear serous exudation, interfering but little with the clearness of the vitreous humor." Among the ocular diseases in which this symptomatic condition may arise, he mentioned glaucoma, serous choroiditis and iritis. Traumatism may also cause it. In the *Transactions of the American Oph. Soc.* for 1892, and as a result of these papers, Oliver published in a most excellent article some valuable clinical points as to the result of careful

investigation on a series of cases of iritis, in which he found increase in the refractive power of the eye.

There seems to me to be no satisfactory reason to seek for the cause of the so-called "symptomatic myopia" in the advancement of the lenticular system toward the cornea as a result of vitreous infiltration. A much less complicated and far more satisfactory explanation is to be had in the presence of a strong, unyielding, tonic spasm of the ciliary muscle, which produces a condition of "spastic accomodation" (Koller). A very common occurrence in our clinics at the large hospitals, in cases of traumatism, (which has been included among the conditions in which "Transient Myopia" is observed) is a tonic miosis—the pupil being contracted to pin-point and remaining absolutely immovable to changes of light and shade, as well as to the mydriatic action of cocaine or even atropine, for a limited period of time. The most simple as well as the most satisfactory explanation in that class of cases in which the refractive power of the eye is increased after a traumatism, would seem to be tonic ciliary spasm coincident with the contraction of the circular fibers of the iris.

In these cases of iritis—the report of one of which forms part of this article—in which a transient myopia develops, or an existing permanent myopia is increased in degree, there must be a shallow anterior chamber present, together with increased intra-ocular tension, if the true cause of the myopia is to be found in the advancement of the crystalline lens. In my case the opposite conditions were present; and yet the myopia almost doubled itself during, and for sometime after the height of the iritis.

In the discussion which followed Mittendorf's paper, the view was advanced that the myopia was due to spasm of the ciliary muscle, which opinion was refuted by the author on the ground that atropine had been instilled for several weeks and that dilatation of the pupil was complete. This objection was answered in Oliver's excellent paper above mentioned. To quote from the article, he says "in nearly every case of iritis, even after full pupillary dilatation, especially in the plastic form of

the disease, there was an even changeable, though relative increase of the refractive power." He speaks of the every-day fact that in young hypermetropes, dilatation of the pupil may be perfect, while paralysis of the ciliary muscle is far from complete. Again and again has it been necessary in my routine refractive work to order the mydriatic continued because of the failure to completely unmask a vigorous spasm of accomodation. The order of events following the instillation of atropine, as is well known, is first mydriasis, later cycloplegia; and it requires no stretching of the imagination to conclude that if dilatation of the pupil so often fails after repeated use of atropine in iritis, a ciliary muscle spasm may easily exist though the pupil dilate ad maximum. The probable cause of this very interesting refractive condition is then to be found in spastic contraction of the ciliary muscle, already inflamed in the almost inevitable involvement of the ciliary body in all forms of inflammation affecting the iris. This tonic muscle spasm does not relax in the manner usual when powerful mydriatic drugs are employed.

A practical point which I wish to urge from the study of the case I am about to detail, is never to prescribe a glass after iritis until the presence of complete paralysis of accommodation has been satisfactorily ascertained by suitable tests. In glasses ordered even as late as two weeks after all evidences of iritis have vanished, there is apt to be an over-correction of the permanent static refractive error and consequent severe discomfort to the patient at a later date.

On October 4, 1894, I was called in to see a patient supposed to be suffering from a severe conjunctivitis, The eye had been "inflamed" a week before this date and boric and zinc drops had been employed. He was suffering from neuralgic pain over the left orbit and temple which was severe enough to prevent sleep the night before. He was florid, of full habit and a subject of rheumatic gout, which, for sometime previous to his ocular disease, had been troublesome.

There was a typical iritis present in his left eye as revealed by a small pupil, and immovable iris which was slightly green-

ish in color and decidedly blurred in its delicate markings. The eyeball was intensely red, both conjunctival and pericorneal injection being present to an enormous degree. A thin muco-purulent secretion gave color to the diagnosis of acute conjunctivitis. The cornea was steamy and chemosis was marked. The lids were red and "puffy." The anterior chamber was deep and tension was not increased. His vision was greatly reduced, falling to fingers at fifteen feet when the right eye was covered. The case was treated energetically. Atropine, cocaine, leeching, hot applications and an antiseptic lotion comprised the local measures. The systemic treatment included free purging with Epsom Salts, salicylates and hyoscine hydrobromate gr. $^1/_{100}$ at bed time hypodermatically administered. He made a rapid and complete cure with round, perfectly dilated pupil. About two weeks after all signs of iritis had disappeared I ordered his distant and near correction which brought the sharpness of sight up to normal. He was given the following: O. D.—0.75 cy. ax. 120° $^6/_{VI}$; O. S.—1.50 ⌒—1.00 cy. ax. 45° $^6/_{VI}$? and his presbyopic correction; + 1.50 sph. added to the distance glasses.

A month and a half later he called to see me about his glasses which were causing him great pain. He stated that he could not see to read with his left lens; but preferred to close that eye. His left vision was now $^6/_{IX}$ without a glass instead of $^6/_{XXIV}$ as formerly, and careful estimation of the amount of error now present revealed the fact that his left eye was greatly overcorrected. He selected now O. S.—0.75 s. ⌒ — 0.50 cyl. ax. 45° V. = $^6/_V$?

The myopia had lessened one-half and the distant vision had improved to very acute normal sight with the weakened concave lens. Reading became once more easy, as binocular near-vision was no longer interfered with by the greatly overcorrected left eye.—*Philadelphia Polyclinic.*

THE TREATMENT OF MEMBRANOUS AND DIPHTHERITIC CONJUNCTIVITIS.

Although croupous inflammation and superficial diphtheritis of the conjunctiva are closely related, and although many modern writers are disinclined to maintain a distinction between these two affections, there can be little doubt that a sufficient number of each class, well marked, render the maintenance of a differentiation scientifically worthy. Croupous conjunctivitis in its pure type is uncommon and its etiology uncertain. It differs from the diphtheritic type chiefly in the fact that there is a painless swelling of the lids and a membranous exudation upon the surface of the conjunctiva, while the latter is characterized by a board-like induration of the palpebræ and an exudation within the layers of the conjunctiva which leads to death of the invaded tissues, and by pressure tends to destroy the nutrition of the cornea. One therapeutic rule, however, is applicable to both affections,—namely, that nitrate of silver, the standard application in severe catarrhal and purulent conjunctivitis, is contraindicated.

In a recent article by Valude (*Annals d' Oculistique*, February, 1894), concerning the various types of conjunctivitis associated with false membrane, this point receives especial attention. He insists that three methods of treatment, often recommended, should receive only condemnation, whether we deal with a pseudo-membranous or a true diphtheritic conjunctivitis,—namely, nitrate of silver, iced compresses, and sublimate lotion. Nitrate of silver has often been shown to be detrimental under these circumstances, cold compresses are likely to add to the depression which the cornea already feels, while sublimate can do no special good, so far as the bactericidal influence is concerned, and is, as is well known, capable of injuring the corneal epithelium.

In Valude's experience, the essential basis of the treatment consists of sprays, frequently used. These should always be warmed, and may be composed of boric acid or any non-irritant mildly antiseptic liquid. He prefers the following lotion:

Extract of opium, gr. iss:
Sterilized water, Oii;

which may easily be prepared by dropping into two pints of warm boiled water ten drops of a standard solution, composed of sterilized water and glycerin, each half a drachm, and extract of opium, fifteen grains. After experimenting with different antiseptic lotions in a large service, he has adopted this liquid, which has proved to be of the greatest advantage in soothing pain and diminishing secretion. Considerable swelling of lids may be managed by using, instead of the lotion just described, a naphtholated solution; but, as he points out, this swelling is not so frequent as in true purulent ophthalmia. In addition to irrigations with the antiseptic liquid, he advises an iodoform salve (1 to 50), to be applied twice a day to the conjunctival cul-de-sac, especially if ulcers of the cornea exist. If there is much suppuration, terpinol is recommended. Terpinol, mixed with equal parts of oil of vaseline or oil of sweet almonds, takes the place of the excipient in the iodoform salve.

Referring to the well-known recommendation of Fieuzal, to touch the false membrane in these cases with lemon-juice, Valude states that he has seen improvement occur, but is inclined to attribute it to careful irrigation rather than to any specific action of the medicament. If it is applied at all, it should be done carefully, with a camel's-hair brush dipped in a solution of the juice, by touching only the false, adhering membrane.

In connection with Valude's experiences in membranous and diphtheritic conjunctivitis, it is interesting to refer to the researches of Gilbert Surdille, elsewhere abstracted in full. He thinks that Fieuzal has rendered a real service in reviving the old remedy,—lemon-juice,—and recommends it, provided too much confidence is not placed in its virtues. Believing the

affection to be a microbic disease, he is inclined to employ phenic acid in a formula composed of five drachms of glycerin and half a drachm of phenic acid. He proceeds as follows: The eyelids are reversed and the conjunctiva is washed with a jet of biniodide of mercury (1 to 20,000). The false membrane is then removed with an alkaline solution, borax or biborate of sodium, after which, with a wad of cotton dipped in the carbolic acid and glycerin solution, all the diseased areas are thoroughly anointed. In the interval he applies a salve of methyl-blue (1 to 1000), because Janicke has demonstrated that Loeffler's bacillus does not grow in bouillon containing methyl-blue, even in very minute proportions.

Surdille very properly discards bloodletting, and also, but this, we think, without good reason, the administration of mercury. In our own experience,—somewhat limited, owing to the small frequency of the affection in this country—in addition to copious irrigation with warm antiseptic solutions and the instillation of atropine, the best results followed the internal administration of quinine, iron, and mercury, the quinine in suppositories, the iron as the tincture, and the mercury either as calomel or bichloride. The last remedy, following Jacobi's recommendation, may be exhibited in milk or water hourly in the dose of $^1/_{60}$ to $^1/_{40}$ grain to children from three to six years of age. Even if the specific action of the remedy is doubted, it has an alterative and tonic influence under these circumstances which is not to be despised. To sum up: During epidemics of diphtheria, especially when the nasal mucous membrane is also affected, the conjunctiva may become inoculated, and a form of conjunctivitis develop almost certain to destroy sight unless prompt treatment is applied. This treatment should consist of copious irrigations with a warmed, mild antiseptic fluid. Boric acid fulfils the indications, and we are inclined to agree with Valude that bichloride has no advantages. Atropine drops are indicated if there is corneal ulceration, or atropine may be used used at night and eserine during the day, in the manner already several times described in these columns in connection with the ulceration occurring in

ophthalmia neonatorum. Iodoform salve should be freely applied within the conjunctival cul-de-sac; indeed, vaseline itself is efficient under these circumstances. Finally, all cauterant applications, particularly nitrate of silver, should be avoided. Very hot water conserves the nutrition of the cornea, and is preferable to the cold applications which are so effectual in the early stages of a purulent ophthalmia. With the special remedies recommended by Valude and Surdille we have no experience, but they suggest trial. Lemon-juice should not be forgotten, and there is enough evidence that good his followed its use to place it among the medicaments best suited to the treatment of this affection. In spite of high authority, we have no confidence in the application of quinine or flowers of sulphur to the diseased lids.—*Therapeutic Gazette.*

A CASE OF RETINITIS PIGMENTOSA, WITH EXTREME CONTRACTION OF THE VISUAL FIELDS AND WITHOUT NIGHT-BLINDNESS.

BY F. W. MARLOW, M.D., M.R.C.S.E.,

Professor of Ophthalmology in the University of Syracuse, N. Y., etc.

Miss K. L. C., aged twenty years, was brought to me early in February, 1893, by Dr. R. J. Dimon, of Hastings, N. Y., for examination of the eyes.

She stated that her symptoms had been present from her earliest recollection. She can only see what she is looking directly at. In looking at the face of another person five or six feet distant, she sees nothing but the face, neither at the sides nor above and below. While walking she always keeps her eyes on the ground to avoid stumbling. She has no more hesitation in going about at night than in the daytime, and thinks there is no more difference between her day and night

vision than is the case with other people. A dull light makes no difference in her ability to read small print.

Examination showed R. V.=$^{6}/_{VI}$ partly — not improved by glasses.

L. V.=$^{6}/_{IX}$ partly—0.5 D cyl. 90° improves slightly.

Reads 1 Jaeger easily.

Her ability to read small print in dull light was compared with my own in the dark room, with gradually diminished illumination, and showed no relative defect. Careful measurement of the field of vision with the perimeter showed the boundary of that of the right eye to lie between 5° and 7.5° from the fixation point in all directions, that of the left eye lying in most directions at 7.5,° in some slightly within that point. The ophthalmoscope reveals the presence of typical retinitis pigmentosa, and the deposits of pigment come within three disc-breadths of the papilla.

Her mother thinks the patient's vision unchanged from earliest childhood, but specific statements made by the patient herself leave no doubt that definite, although probably slight, contraction of the fields has taken place within the last few years.

There is nothing in the obtainable history to throw light on the nature of the causation. She had scarlet fever at five years of age, but vision was defective before then, and her mother says that she always stumbled over things on the floor. I was unable to learn of any eye trouble in the family. Consanguinity in the parents is out of court, the father being of French, the mother of Dutch-Scotch descent.

The history leaves little doubt that extreme contraction of the visual field was present very early in life, and, taking into consideration the extremely slow progress, it seems probable that the condition had its origin during the intra-uterine period of life.

No treatment was advised. I report the case chiefly on account of the entire absence of the most characteristic symptom of the disease.—*N. Y. Medical Journal.*